

School Factors Impacting the Obesity Epidemic:
Physical Education Policy Implementation Challenges and Opportunities

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Abstract

Background: Childhood obesity has more than doubled in children and tripled in adolescents in the past 30 years (CDC 2013). Many factors are responsible for this overwhelming increase in obesity rates. Schools are optimal sites to address the obesity epidemic, specifically targeting physical activity. The 2008 Physical Activity Guidelines state “children, 6-17 years of age need a total of 60 minutes or more of moderate and vigorous intensity physical activity per day” (US Department of Health and Human Services 2008). With children spending most of their daily hours in the school setting, it is imperative that schools incorporate physical activity into curricula. The purpose of this study is to explore whether the current state and district-wide physical education policies are being implemented in schools and to examine the consistency of policy implementation. This cross sectional study builds off of concepts from the Socio-Ecological Model of Health Behavior. **Subjects:** Physical education instructors (n = 19) of children in grades PK-8 from a large urban school district were recruited. **Methods:** Mail in surveys consisting of sixteen questions adopted from national guidelines about the school’s physical education policy and in-class activities were mailed out to physical education instructors. Demographic information (years of experience, educational level) about the instructors were collected. Survey responses were compared to state and district-wide physical education policies as well as the 2008 School-age Physical Activity Guidelines. Descriptive and correlational statistical analysis was conducted. **Results:** The results show that schools are not consistently implementing the established policies and children are not meeting the daily physical activity guidelines. **Implications:** A structured, well-developed physical education policy will help lead a consistent physical activity environment for school-age children in an attempt to make sure daily physical activity recommendations are being met.

Keywords: school-age, obesity, physical education

School Factors Impacting the Obesity Epidemic: Physical Education Policy Implementation

Challenges and Opportunities

Chapter 1: Statement of the Problem

Introduction

According to the Centers for Disease Control and Prevention (CDC), childhood obesity has more than doubled in children and tripled in adolescents in the past 30 years (2013). In 1980, the prevalence rate for children aged 6-11 years old classified as obese was approximately 7%, while in 2010, the prevalence rate increased to nearly 18% (CDC, 2013). Obesity is defined as a chronic medical condition which results in an abnormal accumulation of body fat as a result of “caloric imbalance” or too few calories expended in relation to the calories consumed (CDC, 2013). Childhood obesity can result from multi-factorial influences including environmental, genetic and behavioral factors. The co-morbid effects of childhood obesity, both immediate and long-term, can be devastating to an individual’s overall health and quality of life.

Obese children are at risk for hypertension and hyperlipidemia, both key risk factors for cardiovascular disease (CDC, 2013). In addition, obesity has contributed to the increased rates of type II diabetes, musculoskeletal disorders, sleep apnea, as well as psychological problems including depression and anxiety among children (CDC, 2013). In the long term, obesity in childhood has been shown to contribute to an increased risk of stroke, osteoarthritis, and numerous cancers including cancers of the colon, breast, kidney, pancreas, gallbladder, and thyroid later in life (CDC, 2013).

Preventative behaviors play a crucial role in combating obesity rates. Developing healthy habits early in life not only helps kids grow into physically healthy adults, but can lower their risk of overweight, obesity, and the onset of co-morbid conditions in adulthood. Healthy habits

that include increasing daily physical activity and reducing sedentary behaviors are two major contributors to preventative management and establishing healthy weight status in children.

Physical activity and exercise for children is pivotal in prevention of overweight and obesity. Physical activity is crucial for building and maintaining healthy bones and muscles. In addition it decreases the overall risks associated with obesity and the risks of co-morbidities with other chronic diseases such as diabetes, colon cancer, cardiovascular disease, depression, and anxiety (CDC, 2013). Further, physical activity also has been shown to improve academic achievement and school performance in children (CDC, 2013).

Children spend most of their waking hours in the school environment; schools play an essential role in creating an environment where supportive measures and policies toward the obesity epidemic can be put into place. Educating students and providing opportunities where kids can explore healthy lifestyle patterns and engage in daily physical activity should be a priority for school districts charged with improving the wellbeing of children. Creating feasible and responsible policies, consistent implementation of policies, and regular policy evaluation are crucial to combating the current childhood obesity rates and co-morbid health conditions that impact wellbeing and school performance.

Background of the Problem

Many sectors of society are responsible for the overwhelming increase in obesity prevalence rates over the past two decades. For example, the food industry is one of the broader environmental factors that impacts obesity. Restaurants offer larger portion sizes and fewer healthier options. Fast food chains market to children using toys, music and the most popular iconic figures. Commercials and other forms of advertising during children television programming entice food preferences.

The built environment impacts daily patterns and routines, contributing to the obesity epidemic. Children spend less time exercising or active play and more time watching television, playing video games, and using the computer, indicating an increase in sedentary lifestyle (CDC, 2012). Gone are the days where many children walk to school, as an increase in distance to schools, and transportation preferences have resulted in more busing of children or parents taking children to school. Further limiting daily activity are other built environmental factors.

The widespread use of elevators and escalators has decreased daily activity such as stair climbing and walking (CDC, 2012). Parents concerned about neighborhood safety often limit their children's outdoor play, especially if the children are home alone. However, perhaps one of the major contributors to the increase in the obesity of our children is found within the built environment of our schools.

According to the literature, the physical education offered within our schools has changed. An overwhelming emphasis on academic achievement in core subjects such as reading and math has physical education offerings and physical activities engaged in while at school (American Heart Association, 2008). In addition, school policies are not being fully implemented or are not evaluated to determine if recommended physical education and physical activity guidelines are being met (American Heart Association, 2008). Furthermore, reductions in recess times to meet academic needs have hindered the ability of children to meet their daily activity requirements. Inadequate recess equipment and unstructured activities also contribute to poor activity during actual recess. Not surprisingly, schools are providing to be disadvantageous to the wellbeing of children as a majority of their day is spent in the school setting (American Heart Association, 2008).

The US Department of Health and Human Services holds physical activity guidelines for children ages 6-17. The most recent guidelines, published in 2008 state that children, 6-17 years of age need a total of 60 minutes or more of moderate and vigorous intensity physical activity per day. Much of this moderate to vigorous activity should incorporate aerobic, muscle-strengthening, as well as bone-strengthening activities into their daily regimen (U.S. Department of Health and Human Services, 2008). Being that many children in this designated age group spend at least 8 hours per day, 40 hours a week in a school setting, a great deal of this physical activity must be met within the school setting. Recess and physical education are both important areas in which children can meet this physical activity need. Research demonstrates that many elementary schools are currently lacking in physical education policies. The purpose of this study is to examine whether the current, 2008, physical activity guidelines are being met by today's school-aged children in an urban school environment.

Significance of the Study

With the escalation of childhood obesity prevalence rates, increasing daily physical activity, engaging in regular exercise, and reducing sedentary behaviors all play an integral role in combating this public health concern. The literature indicates that children typically lack a physical activity regimen; there is improper implementation of physical education and recess periods in schools, indicating the need for much improvement. This study will allow for the exploration of current school physical guidelines and to determine if physical education offerings are meeting guidelines in a large urban school district. Through qualitative observational data and quantitative survey data, awareness of and efforts to meet physical activity guidelines by physical education instructors working with elementary school-aged children are examined. Through this exploratory study, physical activity guidelines' and its relationship with actual

educational practice in meeting the challenges associated with childhood overweight and obesity will be extrapolated from a multi-methods approach.

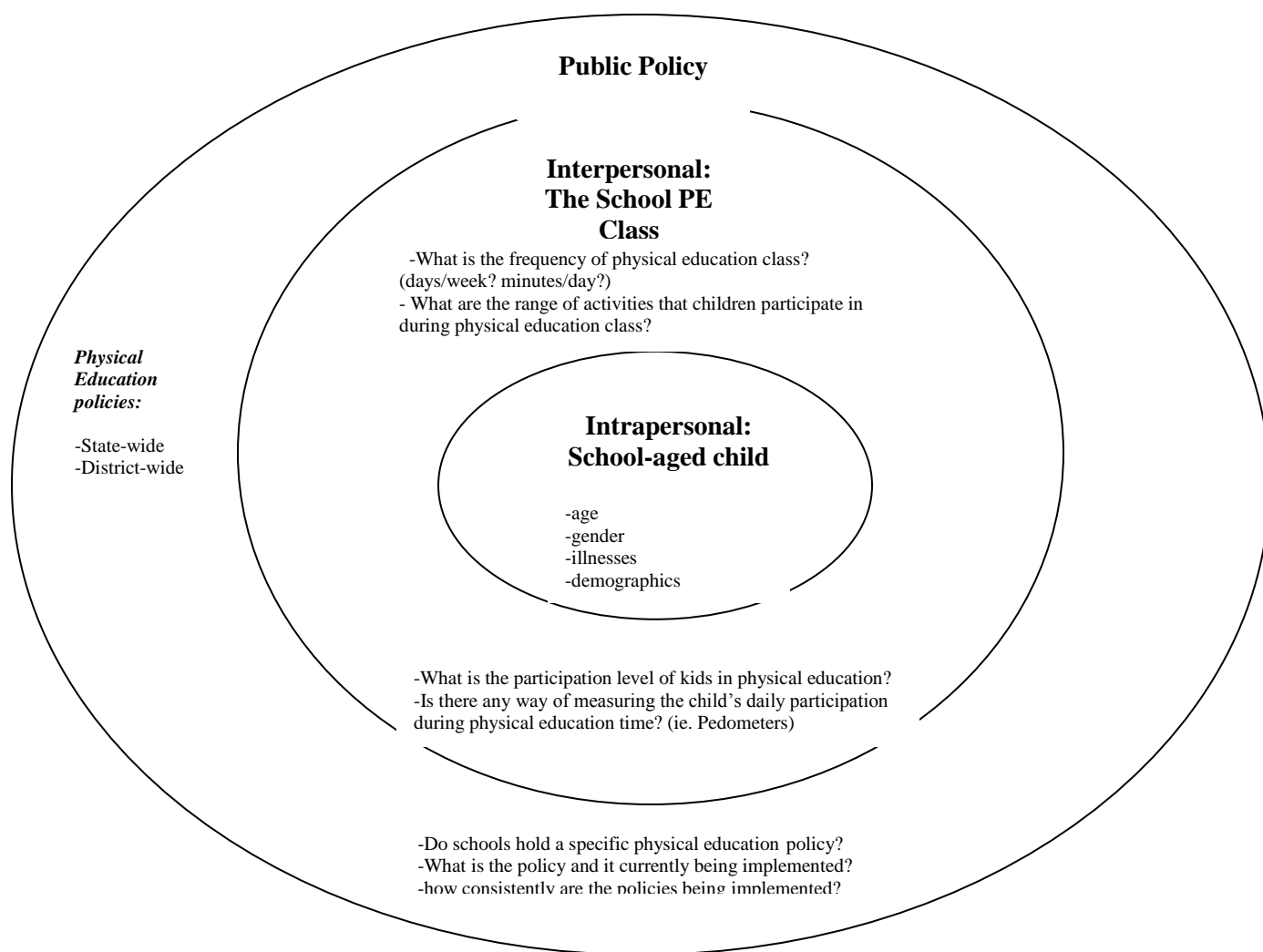
Conceptual Framework

This cross sectional study is based on the socio-ecological model of health behavior. The socio-ecological model recognizes the multiple levels or factors that influence behavior, including: intrapersonal (psychological, biological), interpersonal (social, cultural), organizational (schools and school districts), community and neighborhood, and policy (Glanz, Rimer & Viswanath, 2008). See figure 1 below. The socio-ecological model hypothesizes that behavior change is best supported when the surrounding environment, including the natural environment and the build environment as well as policies and guidelines support the engagement of healthy behaviors (Glanz, Rimer & Viswanath, 2008). Environmental factors that promote targeted behaviors coupled with social support offered through interpersonal relationships provide enhanced motivation to engage in healthful behavioral patterns (Glanz, Rimer & Viswanath, 2008). Thus, individual, interpersonal, and broader environmental or policy driven interventions that impact the multiple and interrelated factors will maximize change in healthy behaviors, including physical activity and exercise.

This study will explore a sub-set of factors found within the socio-ecological model of health. This study will explore intrapersonal, interpersonal, school level, and policy level factors impacting physical education and physical activity among school-aged children residing in a large, urban school district. The study will explore the perceptions of physical education teachers, knowledge of physical education policies, and perceptions of adequate implementation of stated policies within the school setting. Typical challenges, barriers, and typical routines within physical education courses will be explored. A better understanding of the interaction of

these multiple and interrelated factors is critical in school-based efforts to combat the childhood obesity epidemic (Glanz, Rimer & Viswanath, 2008).

Figure 1: Socio-ecological Model of Engagement of Physical Education in Schools



Research Questions

- 1.)
 - a. Do schools have physical education policies?
 - b. Are stated physical education policies being implemented?
 - c. What is the frequency of physical education in schools?
- 2.) What is the range of activities that children participate in during physical education class?

- a. What is the participation level of kids in physical education?
- b. Are there any means of measuring the child's daily participation by quantifiable methods?

Definition of Terms

Aerobic Activities: Physical activity which involves the use of the body's large muscles moving in a rhythmic manner for a certain period of time. Examples include: running, hopping, skipping, jumping rope, swimming, dancing, bicycling (CDC, 2011).

Bone-strengthening activities: any physical activities that places a load or impact on the skeleton, this includes activities such as running, jump rope, basketball, tennis, or hopscotch (CDC, 2011).

MET (metabolic equivalent): a unit used to roughly estimate the amount of oxygen used by the body during physical activity (CDC, 2011).

Moderate-Intensity Physical Activity (MPA):50-70% of maximum heart rate, able to talk but can't sing 3-6 metabolic equivalents (METs), or any activities that burns 3.5-7 calories per minute (CDC, 2011).

Muscle-strengthening activities: playgrounds, climbing trees, tug-of-war (CDC, 2011).

Vigorous-Intensity Physical Activity (VPA): large increase in heart rate and breathing, conversation is difficult, greater than 6 metabolic equivalents or any activities that burns more than 7 calories per minute (CDC, 2011).

Limitations

There are several limitations to this study. First, actual physical activity and exercise within schools was not measured or observed. This study relied on a retrospective self-report of activities by self-identified physical education instructors. Second, physical education

information may be subject to bias and/or reporting error based on knowledge of school's educational practices or expectations. Next, this study was cross-sectional and did not measure behaviors or practices over time. In addition, only a large urban district was surveyed and thus the findings are not generalizable. Another limitation is the limited age range of children that was targeted; only pre-kindergarten through fifth grade (early elementary schools) were included. However, due to inconsistent structures of schools within districts, some schools included in this study had older elementary or middle school grades. Data from those grades were not included in this study. Furthermore, the study survey only queried subjects about formal physical education and did not ask about other activities in school settings such as recess or active classrooms; those forms of activity or exercise are not captured. Lastly, because of the pilot nature of this study and the small sample size, gender specific differences in physical education or physical activity were not analyzed.

Chapter 2: Review of the Literature

A review of the literature was conducted using research databases, PubMed, Cochrane Library, and CINAHL. The search was defined to answer three major questions: “What is the usual physical activity amongst school-age children?”, “What does a current elementary school provide when it comes to physical activity?”, and “What types of physical education policies currently exist?” In addition, research was done to examine the current recommendations and guidelines for physical activity in school-age children. Parameters in searching for articles focused on current practices and recommendations, consequently, only articles published between the years 2005 to 2013 were included. The search was limited to include only articles written in the English language. In addition, search term keywords included: elementary age, school-age children, physical education policies, and typical physical activity. The search was further refined by selecting only early elementary age, specifically kindergarten through fifth grade. Forty articles were found and critically reviewed from a variety of sources, including governmental organizations and national associations featuring guideline recommendations, peer-reviewed public health journals, and other peer-reviewed interdisciplinary journals. More specifically, attention was paid to research and evidence-based practice articles.

Physical Activity Recommendations for School-Age Children

The U.S. Department of Health and Human Services (HHS) (2008) recommends that children aged 6-17 participate in at least 60 minutes of physical activity daily. The 60 minutes of daily physical activity should include age appropriate aerobic, muscle strengthening activities as well as bone-strengthening activities (HHS, 2008). The United States Department of Agriculture (USDA) (2012) recommends that muscle-strengthening activities should be included in a child’s daily physical activity regimen at least three days a week. In addition, bone-strengthening

activities must also be included at least three days per week (USDA, 2012). Aerobic activities are those that require individuals to move their large muscles in a rhythm. These activities may include but are not limited to running, swimming, dancing, and bicycling. Muscle-strengthening activities include activities such as playing tug-of-war, climbing trees, use of playground equipment and bone-strengthening activities include running, jump rope, basketball, tennis, hopscotch (HHS, 2008; USDA 2012).

Time Spent in Physical Activity

While the recommendations firmly state that children should be engaging in at least 60 minutes of physical activity per day, there are specific means in which this physical activity must be exerted. The American Heart Association, Cancer Action Network, and American Diabetes Association (2012) support the stance that at least 50% of physical education time should be spent in moderate to vigorous intensity aerobic physical activity (MVPA) (American Heart Association, Cancer Action Network, & American Diabetes Association, 2012). According to Ganley et al. (2011), from a child's physical fitness standpoint, "'moderate intensity activity' is described as activity that allows the individual to notice an increase in heart rate and respiratory rate. On a scale of 0 to 10, moderate intensity would be a 5 or 6. 'Vigorous intensity activity' is described as feeling the heart beating much faster and breathing much harder than normal. On a scale of 0 to 10, vigorous intensity would be a 7 or 8." (Ganley et al. 2011, page 213).

The Benefits to a Daily Physical Activity Regimen

There are several benefits to maintaining a daily physical activity regimen. First and foremost, regular, consistent physical activity impacts the health of the child as well as his future health. Regular physical activity reduces the risk of obesity and chronic illnesses such as diabetes, colon cancer, hypertension, arthritis, asthma and cardiovascular disease (HHS, 2008).

Likewise, studies have linked daily physical activity to the promotion of a decrease in stress, depression, and anxiety, an increase in self-esteem and self-concept and an overall sense of psychological well-being (HHS, 2008; Larun et al. 2006). In addition, research indicates that 95% of adult bone mass is accumulated by teenage years. Activities such as jumping, hopping, and skipping are helpful in continuing to form strong bone mass (Vicente-Rodríguez, 2006).

Not only are teaching and accomplishing daily physical activity crucial components in helping our children grow, but they are necessary to establish healthy habits for later in life. Research shows that physical activity patterns that are developed in childhood are taken into adulthood (Landry & Driscoll, 2012). The U.S. Department of Health and Human Services also stresses that “adult health risks related to a poor fitness regimen and increased fat are decreased by creating good exercise habits early in life” (HHS, 2008).

The School’s Role in Physical Activity

Since children spend most of their days in the school environment, schools provide a crucial opportunity to meet the physical activity requirement, to teach them about the importance of physical activity, and to instill a desire to be physically active for years to come. Schools play an important role in including comprehensive physical activity through the day including but not limited to physical education, after-school sports, intramural physical activity, classroom physical activity, and recess. The 2004 National Association of Sport and Physical Education guidelines (NASPE) (2011) and American Heart Association (2008) recommend that elementary students be offered at least 150 min/week of physical education in order to meet the current recommendations of 60 minutes of physical activity per day (NASPE, 2011; AHA; 2008). However, statistics have revealed that fewer than 20% of third grade students at public elementary schools in the US were offered this during the 2007-2008 school year. (Turner et al.,

2010; Slater et al., 2012). Furthermore, only 42% of children ages 6-11 years and 8% of adolescents ages 12-19 years meet the physical activity guidelines of 60 minutes of physical activity per day (HHS, 2008; Troiano, 2008). Lastly, studies also show that schools either have 20 minutes of daily recess or 150 min/week of PE were less likely to have the other, demonstrating schools are substituting one form of PA for the other rather than meeting both recommendations for PE and recess (Slater et al., 2012; Evenson et al., 2009).

Barriers to Physical Activity in Schools

One often considered reason schools may lack in providing structured physical education time in schools is due to the stress and demand of meeting academic goals. Many schools may feel like they do not have the time throughout the school day to set aside time for physical activity. They may feel that using what would be structured time for physical education can be used to improve test scores and academic achievement.

Coe et al (2006) has explored the relationship between physical education and academic performance. In a two-group design, one group of students was enrolled in physical education during the first semester of school while the other group was enrolled in physical education the second semester. During the semester in which the students did not have physical education, they were enrolled in an alternate exploratory class. Although students did not perform better academically during the semester they were enrolled in physical education classes, they also did not show a decrease in academic achievement compared to the student who received an extra hour of academic instruction per day (Coe et al., 2006). Thus, this study has demonstrated the amount of moderate physical activity exerted by students did not affect academic achievement, however there was a significant association found between that of academic achievement and vigorous activity. During the first semester, students who participated in any amount of vigorous

activity demonstrated better academic achievement compared with those who did not participate in any vigorous activity (Coe et al., 2006). In other studies, higher levels of physical activity have been associated with improved cognition and academic performance (SPARK, 2012). SPARK, a research-based, public health organization has repeatedly shown in its 20 plus years of evidence-based programming that exercise directly impacts the behavior and development of the brain (SPARK, 2012). However, the link between physical activity and academic performance is inconclusive.

Some studies also have shown that physical activity improves “students’ academic performance including grades, academic behaviors, and concentration in the classroom”, while other research indicates no relationship between physical activity and academic achievement (Center for Disease Control [CDC], 2010). However it is important to note that increased time in physical education appears to have no negative relationship with the academic performance of elementary school-age children. Administrators and Policy makers need to be well-informed that “increasing or maintaining time dedicated to physical activity may help but it does not appear to adversely affect academic performance” (CDC, 2010, page 6).

The Lack of Physical Education in the School Environment

Some elementary schools provide physical education on a daily basis, others on a weekly basis, some on a semester basis and others provide no physical education. Present research shows that schools are not meeting the current physical education recommendations of 60 minutes of MVPA per day for school-aged children through the physical education environment. According to Lee (2006), in 2006, “only 3.8% of elementary schools, 7.9% of middle schools and 2.1% of high schools in the United States provided a daily physical education class (page 449)” Furthermore, the National Association for Sport and Physical Education and American Heart

Association (2012) released a report on the status of physical education in American schools. They reported that only 3 states required the recommended 150 minutes per week of physical education in elementary schools. Lastly, Slater et al. (2012) found that having a longer school day increases the chance of meeting the NASPE recommendations for physical education.

State and District School Policy's Impact on Physical Education

The review of the literature provides that state- and district-wide policies have an impact on the physical education provided in school. Several studies concur that state laws and district policies have a strong potential to influence the physical education time available in schools. While some state laws and policies referring to physical education fall well below the recommended school-age activity guidelines, even states and district with weaker policies that consist of not as much time for physical education throughout the school days have an increase in PE time (Turner et al., 2013; Chriqui et al., 2013; Slater et al., 2012). However, there are states that lack a state-wide PE policy but several districts within that states have their own specific policies. Even without the state policy, district policies can influence and contribute to the physical activity children are receiving throughout the day. Results in a study examining physical education policies across the nation concluded that having strong district-level physical education policy increased the chance that schools had 150 minutes per week or more of physical education time regardless if the state had a strong physical education law (Slater et al., 2012). However, some states and districts still lack physical education policies of any kind. More efforts are needed to strengthen district and state wide policies while at the same time consistently implementing current policy (Turner et al., 2013; Chriqui et al., 2013). In addition, states and districts having physical education policies have proven that policies need to be stronger and specific in language (Carlson et al., 2013). Carlson et al. (2013, p.155) notes that “without clear

policy language and accountability, schools may continue to provide insufficient opportunities for physical activity. More states need to adopt a comprehensive school activity policy that specifies required minutes of weekly physical education, percent of physical activity in physical education.” If state and district policies adapted more specific policy language to prevent potential loopholes, they may have a greater impact on school physical education.

Examination of the Ohio Department of Education’s Physical Education Policies

Through examination of the Ohio Department of Education’s Physical Education standards and policies, the state in which this study takes place, it’s clear that Ohio’s Academic Content in Physical Education is developed through the use of six standards. These standards include “demonstrating motor skills and movement patterns, participating in regular physical activity, demonstrating the understanding of physical activity strategies, tactics, components, maintain a health-enhancing level of fitness, demonstrating personal and social behavior that respects self and others in the physical activity setting and a demonstration of value of physical activity” (Ohio Department of Education, 2014, Academic Content Standards and Evaluation Instrument). The standards are developed further to feature benchmarks for grades K-12 and examples of specific activities are given that can be used to achieve these standards. What the standards and benchmarks do not offer is any specifics on concrete details on required time spent in physical education per week or how time spent in physical education should be conducted (Ohio Department of Education, 2014). Furthermore, after examining the district policies associated with this large urban area, it is evident that the physical education policies are very vague in terms of concrete requirements for designated physical education on a weekly basis.

Implementation and Evaluation of Physical Education in Schools

Implementation and evaluation of the physical education policies provide other issues of concern. Many schools do not feel that they have enough support to provide adequate and regular physical education courses to school-age children. Common barriers included lack of adequate, knowledgeable staff, class sizes, lack of available equipment, financial constraints, and lack of making physical education a district priority (Slater et al., 2012; Nichol et al., 2009). In a review of the school's environment and its influence on physical activity, one study showed that the more supportive features, such as a gymnasium, soccer fields, playground equipment, etc was associated with greater participation in overall class time and free time physical activity at school. Furthermore, the study went on to provide that "overall school recreational environment may be more important in promoting physical activity than any single policy, facility or recreational opportunity" (Nichol et al., 2009, p. 251). Another area of concern is the lack of evaluation, monitoring and enforcement of the physical activity policies that are provided. Evaluation and monitoring of physical education courses need to be done on a consistent basis to make sure that the physical activity guidelines are being met (Carlson et al., 2013).

Gaps in the Literature

What the literature is lacking is observation on how time is being spent in physical education in schools that do hold physical education courses. The current policies recommend that children should be getting 60 minutes of moderate to vigorous activity a day. Are children meeting the "moderate to vigorous activity" requirement? The time that children are spending in physical education may not necessarily be devoted to physical activity-attendance time, elimination games and waiting in lines for turns are just a few examples of how physical education courses may not adhere to the appropriate MVPA recommendation (Fernandes & Sturm, 2011). Furthermore, are the activities being implemented during physical education

courses evidence-based? One study recommends “fitness fusion interventions”, also known as high intensity activity such as running and jumping be incorporated to usual physical education lessons. Not only does it increase active learning but it requires minimal organization on the teacher’s part. (Lonsdale et al., 2013).

Conclusion of the Literature Review

In conclusion, physical activity is beneficial to the development and growth of children nationwide. It is a protector against chronic illnesses, it has been shown to increase concentration in the classroom setting, and has major psychological benefits. The U.S. Department of Health and Human Services recommends 60 minutes of physical activity per day with at least 50% of those minutes spent in moderate to vigorous physical activity. Many children are not meeting the current recommendations. Schools provide an appropriate environment in helping children to meet the physical activity guidelines, however many schools do not provide regular, consistent physical education. State and District wide policies have proven to be beneficial in influencing the physical education provided in schools, however many of these policies do not meet recommended guidelines and lack policies that are specific and strong in their language. Lastly many schools lack a means of monitoring and evaluating the school-based PE programs to ensure that physical activity recommendation are being met.

While it is evident that state and district wide policies effect time spent in PE, this study examined how children are spending their time in physical education. What specific activities are in place? Are children meeting the moderate-vigorous activity requirement? Are physical education teachers creating activities that are evidence-based? Lastly, if physical education is being implemented in schools, does the school offer a way of evaluating the physical education on a consistent basis? The intent of this study is to investigate the answer to these questions.

Chapter 3: Methodology

Research Design

This descriptive study was a cross-sectional design which relied on self-reported perceptions, interpretations, and actual activities of children by physical education instructors. Furthermore, the study a large urban school district; schools were selected for recruitment based on their inclusion in the school district. Private or charter schools were included.

Population and Sample Design

Physical Education instructors from fifty different elementary schools in a large urban school district were recruited. Public, private, and charter schools were selected randomly from GreatSchools, a website which evaluates the test scores, enrollment, programs and cultures and rates schools based on these categories. In addition, the database provides the school's ethnicity of the students and staff, Ohio Graduation Test scores, and the relative socioeconomic status and disabilities found within the school (GreatSchools, Inc., 2014). The fifty schools selected had students from grades anywhere from pre-kindergarten to eighth grade. Ethnicities of the schools surveyed included Hispanic, Black, White, two or more races, Pacific Islander, Asian, and American Indian/Alaskan native. Schools ranged anywhere from being 22% to 99% economically disadvantaged and other schools had no data included. Disabilities of students from the fifty schools were anywhere from 8% to 30% of the student population. Lastly, the total number of students in each of the schools was anywhere from 50 students to 580 students.

Data Collection Procedures

Mail in anonymous surveys consisting of sixteen questions adopted from national guidelines about the school's physical education policy and in-class activities were mailed out to physical education instructors. Questions consisted of topics such as the frequency of physical

education for each student, the physical education policy associated with the school and the implementation and evaluation behind it, the participation policy, and the intensity of the activity associated with the physical education environment. In addition, instructors were asked if they addressed and taught students topics regarding health, physical activity or exercise. They were asked to comment on the equipment available for in-class physical education and at the end of the survey, they were given the opportunity to express their opinions on the current physical education program in their school. Physical education instructors were given a \$5 gift card as an incentive for their participation in the study and were given a total time of three weeks to fill out the surveys and return them. Surveys were mailed out near the end of November 2013 and were asked to be returned by late December 2013.

Data Collection Instrument

Survey responses were recorded into an excel word document and then data were transferred into SPSS v21. Descriptive and correlational statistical analysis was conducted. Survey responses were compared to state and district-wide physical education policies as well as the 2008 School-age Physical Activity Guidelines.

Data Analysis

Response Rate. Of the fifty mail-in surveys sent out, nineteen surveys were completed and returned and three were returned undeliverable, giving a 40% response rate. Respondents were from several different zip codes.

Representativeness and Profile of Sample. Demographic information about the instructors was also collected through the mail-in surveys. Of the nineteen respondents, physical education instructors indicated that they had been teaching anywhere from 4 months to thirty-eight years, with a mean of 16.8 years. When asked the length of the instructors had been

teaching physical education, the same answers ranged from 4 months to thirty-eight years, with a mean of 16.7 years ($SD=9.61$). In addition, the time spent teaching at their current school ranged from 4 months to thirty-eight years, with a mean of 9.1 years. The length of the school day ranged anywhere from 360 minutes to 480 minutes, with half of the schools demonstrating a 390 minute long school day.

Application to Research Questions. Survey data were compared to state and district-wide physical education policies as well as the 2008 School-age Physical Activity Guidelines to draw conclusion regarding physical education in this particular school district. Means, the valid percent, and standard deviations were also used to complete analyses.

In conclusion, in this cross-sectional study, mail- in surveys consisting of sixteen questions were sent to fifty different schools in a single school district, randomly selected from the use of a website known as GreatSchools. Descriptive data on each school were collected including, number of students, grades, gender, and student ages. Demographic information were also collected on the physical education instructors including years of teaching experience and years teaching physical education. Of the fifty surveys mailed, three were returned as undeliverable, and nineteen were returned with completed responses. Descriptive and correlational statistical analysis was used to examine the results and draw conclusions.

Chapter 4: Research Results

Our results collected data on the demographic information of all physical education instructors at the nineteen different schools. Furthermore, schools were asked more specifics regarding grades that receive physical education and the frequency of this physical education on a per week basis. Data was also collected on the overall physical education policy implemented at each school and details regarding the evaluation of this particular policy were asked. In addition, data was collected on how time is specifically spent in physical education class. Lastly, instructors were given the opportunity to indicate their satisfaction level and opinions regarding the physical education students are currently receiving in their school environment.

Response Rate of Sample/Population. Fifty surveys were mailed-out; nineteen were returned, and three were undeliverable thus resulting in a 40% response rate. Surveys that were returned came from many different schools in the school district area, representing eleven different zip codes in the school district with 72.2% being public and 27.8% of the schools private or charter. Over half the schools demonstrated a school day of 390 minutes, with other schools ranging from 360 to 480 minutes.

Representativeness of Sample. Educational instructors had a mean of 16.75 years (SD = .61) of total teaching with a range of four months to 38 years. In addition, these instructors indicated a total length of 16.65 years (SD = 9.73) of teaching solely physical education with a range of four months to 38 years. Lastly, instructors indicated teaching at their particular school for a mean of 9.11 years (SD = 9.94) with the range anywhere from four months to 38 years total.

Of the nineteen schools, a typical physical education class consisted of a mean of 25.11 students (SD = 4.92) with a range from 22 students to 30 students, with one private school

indicating a total of seven students in a class. Of the surveys returned, 68.4% teach physical education to six different grades, 15.8% teach physical education to seven different grades and 15.8% teach physical education to nine different grades. In schools surveyed 68.4% teach physical education to grades kindergarten through fifth, 15.8% teach kindergarten through sixth and 15.8% teach physical education kindergarten through eighth grade.

Profile of Sample/Population. When asked the frequency of time spent in physical education per week, instructors indicated that students in early elementary, grades kindergarten through third, 47.4% receive 30 minutes of physical education per class period, with a mean of 35.26 minutes ($SD = 6.34$) and a range of 30 minutes to 50 minutes. Furthermore, 68.4% receive physical education less than 40 minutes per class session. In late elementary, grades fourth through eighth, 63.6% of the students receive physical education a total of 40 minutes per class session, with a mean of 42.47 minutes ($SD = 3.44$) and a range of 40 minutes to 50 minutes. To expand on the frequency of physical education, schools indicated that a majority, 68.4% receive physical education one time per week, with a mean of 1.34 ($SD = .58$) and only one school indicated having physical education three times per week.

When asked about the school's physical education policy, slightly half of the school's have a physical education policy, with 70% of those schools are implementing it. Three of the instructors expressed that their school's specific policy included that the students were just required to take a physical education course. Three other schools indicated that they follow the district's physical education policy of "Kindergarten through third must have 30 min per week while fourth through fifth grades must have 40 min per week and that physical education class must occur one time per week." A couple ($n = 2$) of other surveyed schools indicated following state and district policies. When it comes to evaluation of the physical education policy, the

results were scattered and inconsistent, ranging anywhere from never evaluated to five times per year.

How time is spent in physical education class. When asked if schools had a participation policy for physical education class, 83.3% of the schools indicated “yes”, with 88.9% stating that there was a means of measuring the participation in their physical education class. However, a majority of instructors ($n = 12$) indicated that secondary observation was the means by which this participation was measured. A few instructors ($n = 3$) indicated the use of pedometers to calculate activity level and steps taken on a per class basis while other instructors revealed the use of the state-wide assessment standards to gauge participation. One school mentioned that students fill out a self-evaluation after each class.

Intensity and Frequency of Physical Education Activities. Our results demonstrate that 94.7% of the nineteen schools participate in moderate intensity activity with 62.5% indicating frequent participation of one time per week. When asked about the time spent in moderate intensity activity, seven schools left the question blank, and of the twelve schools that did respond, 66.5 % of the schools concluded at least half of the class period is spent in moderate intensity activity. One school indicated spending the entire class period in moderate intensity activity. Instructors indicated activities such as sports games, jump ropes, and running as a part of their moderate intensity activities, however several instructors mentioned that the intensity of the activity is dependent on the student’s effort level.

When asked about the time spent in vigorous intensity activity, 78.9% of schools indicated participation in vigorous intensity activity, however when they were asked the frequency of this activity, only nine of the nineteen schools answered, with the majority of the schools, 44%, indicating one time per week spent in vigorous intensity activity and 33% of the

schools who responded suggested only one to two times per year. Furthermore, when asked the minutes spent in the vigorous intensity activity, only six schools answered, with half indicating roughly 60% of class time being spent in this type of activity. Vigorous-intensity activities specified included the mile run, sports games, and jump ropes, again, dependent on the student's effort level.

Instructors were also asked if there was a time in each class session in which they educated students regarding the importance of wellness, physical activity, and exercise. 89.5% of instructors indicated that this did occur. Instructors demonstrated that topics stressed included healthy eating and exercise habits, lifelong fitness, and the consequences associated with poor health and fitness such as heart disease, obesity, and strokes. Instructors were also asked about the availability of equipment at the school. Most instructors indicated having readily available equipment with the top items being sports balls, hula hoops, scooters, nets, and jump ropes. A couple of schools mentioned that they must borrow equipment from other schools.

Lastly, instructors were asked about their satisfaction regarding the physical education that students in their school were currently receiving. Only one-third of the instructors demonstrated satisfaction with their current physical education program with a majority of instructors indicating dissatisfaction. Many indicated the need for more time through the week to instruct students and provide ample time for activity, with a majority of the instructors wanting students to have physical education three to five times per week. Several instructors also declared the need for new, updated equipment as well as a better space to hold class time.

Research Questions. In addressing the research questions for which this study was based, 52.6% of the nineteen schools indicated having a physical education policy for their specific schools, however when asked if the policy was being implemented, two of the ten

schools who indicated having a physical education policy did not respond and the other seven indicated that they are currently implementing it. Results indicating evaluation of these policies were scattered and inconsistent ranging anywhere from never to five times per year.

In addition, the majority length of time being spent in each physical education class for grades kindergarten through third was roughly 30 minutes, with a mean of 35.26 minutes ($SD=6.341$) and 63.6% of grades fourth through eighth spending 40 minutes in physical education, with a mean of 42.27 minutes ($SD= 3.44$). Results indicated that over 68% of all grades at each school spent one day per week in physical education class.

Instructors indicated that children spend their physical education time doing several activities including, 83.3% of the schools indicated having a participation policy for physical education, however when asked how they measured the participation policy, a majority of the answers included observation only, making this a subjective measurement. In terms of activity level of students during time spent in physical education, 94.7% of the schools indicating children participating in moderate intensity activity with a majority designating the activity occurring at least half of the class, at a frequency of one time per week. With regards to vigorous intensity activity, schools responded with 78.9% of schools participating in vigorous intensity physical education, with a majority of the vigorous intensity activity occurring at least 60% of the class. 44% of the schools indicated that this activity occurs once per week, 33% suggested only one to times per year, while 22% if the schools who disclosed one to two times per month.

Chapter 5: Summary, Conclusions and Recommendations

Summary of Findings and Conclusions

First and foremost, slightly over half of the schools surveyed conveyed having a specific, concrete, physical education policy. Many of these policies varied from having policy that required instructors to have physical education for a specific amount of time per week, others said that the policy indicated that they just needed to take the course, and a couple of the other schools indicated following state and district policies. These results are almost parallel to the research found in the literature review and demonstrate that the school physical education policies are vague and not concrete and that some schools have no policies and guidelines as to how to provide physical education to their students. Of those schools who demonstrated a physical education policy, a majority, 70% indicated the implementation of this policy on a regular basis. Lastly, data demonstrating evaluation of these policies on a regular basis were scattered and inconsistent ranging from never to five times a year which raises the question, are students receiving the most evidence-based, updated physical education needed to maintain healthy lifestyles?

When instructors were asked about the participation policy implemented at their school, a large majority of the schools, 83.3%, said there was a policy in place, with many indicating that all must participate unless a doctor's note is provided. Of those who said a participation policy, 88.9% indicating that there was a means of measuring the participation in their physical education class, however a majority of instructors shared that observation only was the only means by which this participation is measured, making this subjective and an inaccurate measurement of the true physical activity students are receiving in physical education class. A few of the schools conveyed the use of the pedometers that each student wears to meet a set

number of step requirements and their grades are based on this. Another instructor indicated the use of the state assessment to monitor participation throughout the class period.

None of the schools surveyed met the requirements for The National Association of Sport and Physical Education (NASPE) and American Heart Association recommend that elementary students should be offered at least 150 min/week of physical education in order to meet the current recommendations of 60 minutes of physical activity per day. On average, the majority of schools indicated only having physical education one time per week, with grades kindergarten through third receiving anywhere from 30 minutes to 50 minutes per class and grades fourth through eighth receiving anywhere from 40 to 50 minutes per class. These findings suggest that students are not getting enough activity throughout the school day and are not meeting current national recommendations.

Another concerning finding was the intensity level and activities that occur during the time spent in physical education. Many of the schools indicated incorporating a plethora of different muscle-strengthening, bone-strengthening, and aerobic-strengthening activities with the top three activities being running, a variety of sports games such as basketball, soccer, tennis, etc., and jump rope. In addition, with the United States Department of Agriculture recommends muscle and bone-strengthening activities at least three times per week, it is evident that a majority of students are only receiving these types of activities one time per week in their weekly physical education class. That is not to say that they could receive these activities elsewhere in the recess environment or outside of school. With much of the literature recommending that at least 50% of physical education be spent in moderate to vigorous activity, all but one school conveyed that students participate in moderate intensity activity, with 62.5% of those schools indicating that this occurs at least one time per week for at least half the class. Of the nineteen

schools, 78.9% communicated incorporating vigorous activity into their physical education class but when asked the frequency, only half of the schools answered, with a majority of schools offering vigorous activity less roughly one time per month. Furthermore, when expanding on the time spent in class in vigorous intensity activity, only six schools answered, indicating that when vigorous activity is occurring, it occurs for 50% of the class time. These results have several gaps, as many of the instructors failed to elaborate on the frequency and time spent in vigorous activity which makes it hard to understand if students are truly getting the appropriate activity needed during their physical education time.

A majority of instructors offered dissatisfaction with the current physical education policy in place, with only one-third of instructors that were surveyed expressing satisfaction with their policy. Several indicated that students need physical education more than once per week. Some communicated that they would like to see physical education held at least two to three times a week and instructors also expressed frustration with the little support they felt they were getting from the district regarding equipment, large class sizes, and more space to hold classes. They also emphasized the need for better equipment that will help to monitor the effort level of the students during physical education time. Through these findings, it is evident that physical instructors feel that more support is needed from district and state-wide policy makers in order to carry out and implement proper suitable physical education that meets the needs of all students.

Implications of Study

Children generally are not meeting the current recommendations for physical education in the school environment. While our study did not take into account recess time or the activity that occurs outside the school day, from our results, we know that schools do not offer enough

time per week to provide physical education to their students. Further research is needed to gauge the total amount of physical activity that a child receives throughout an entire school day.

Furthermore, more concrete, specific, well-developed policies are needed in the school physical education setting. In addition, these policies need to be evaluated and updated based on the needs of students on a yearly basis. Through our findings, a majority of the instructors did not have specific policies used to incorporate physical activity into their physical education classrooms and those that did have policies did not have concrete, well-developed policies to follow. It is hard to gauge whether these policies are updated, and evidence-based due to the inconsistent, and scattered results demonstrating how often these policies are truly evaluated.

In expanding upon the needs for concrete policies, many schools do not have the means to measure the participation and effort-level of students in the physical education environment. With observation being the main method used to measure the physical activity the student is receiving, this is subjective by instructor and does not provide a tangible, firm means of measuring the participation of our students. Furthermore, more equipment is needed to measure the effort level of our student to ensure that they are meeting the moderate to vigorous activity level recommendations. Not only are students not receiving the appropriate amount of physical education per week, but the physical education that they are receiving may not be at the appropriate intensity level.

While the physical activity of our students may not meet current physical education recommendations, many instructors conveyed the use of time during physical education to stress the importance of self-care, lifelong wellness and the consequences of poor a diet and physical activity regimen. The physical education environment offers an excellent opportunity for

students to expand their knowledge on the importance of everyday activity and healthy eating while experimenting with different physical activity firsthand.

Lastly, results of our study indicate the physical education instructors need more support from district and state-wide law and policy makers. With limited resources, time and space, it is hard for instructors to implement strong physical education programs that meet the physical activity needs of our students and current guidelines set forth by national organizations.

Recommendations

With the current obesity epidemic that our nation is facing, an overwhelming amount of importance is placed on the schools environment and instructors to help meet kid's physical activity needs. The formation of a specific physical education policy with concrete guidelines, protocols and practices should be implemented. In addition, this policy should be evaluated on a consistent, annual basis to ensure that physical activity needs are being met and evidence-based practices are occurring. One study found offered several strategies to develop more concrete, elaborate physical education policies. These included using policies that are stronger in wording with more specific language, such as the use of "Moderate to vigorous Physical Activity, or MVPA" instead of just "physical activity". In addition, policies should require a specific number of minutes of weekly physical education in which youth are not inactive whatsoever. This set number would not include any teaching that goes on inside the physical education environment. Furthermore, evaluation components need to be included in these school based policies. Components should include cost-effectiveness and obesity prevention and academic performance outcomes. Lastly, the study pointed out that states should introduce an "implementation monitoring system" so they can monitor the use of these policies moving forward (Carlson et al., 2013).

Furthermore, physical activity does not have to be contained to just the physical education environment. One study examined offered a few other school-based evidence-based suggestions as to how schools could help to promote healthy and safe environments that help contribute to the development of children. These suggestions include, on-site school wellness coordinators throughout the district that work with nurses, schools, and leaders of communities to help create healthier school environments and work to support high-risk students and their families. Another suggestion includes the coordination and establishment of school wellness councils where students and staff work together to positively impact wellness plans at schools. These councils could contribute an important role in helping to promote and shape school policies and practices that influence healthy eating and physical activity in a positive manner including modifying school lunches. In addition, suggestions include school nurses working with students to complete body mass index assessments and refer high-risk students to resources and referrals (Tuckson, 2013).

With the childhood obesity epidemic on the rise, and children spending a great deal of their days in the school environment, it is crucial that more time be spent educating on the importance of exercise and providing physical activity on a daily basis. Physical education is one part of the school curriculum that must be examined and addressed. More support is needed from state and district authorities to provide physical education opportunities for our students. More concrete, evidence-based policies are needed to guide physical education practices and these policies must be evaluated on a regular basis in order to keep-up with evidence-based changes.

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Appendix A

Table A1. Frequency of physical education per week

Grades K-8 (n=19)

Days/week	Frequency	Percent
1	13	68.4%
1.5	1	5.3%
2	4	21.1%
3	1	5.3%

Mean: 1.34 days (std. deviation = 0.58)

Table A2. Minutes of physical education per class

Early Elementary (K-3) (n=19)

Minutes	Frequency	Percent
30	9	47.4%
35	4	21.1%
40	3	15.8%
45	2	10.5%
50	1	5.3%

Mean: 35.26 minutes (SD = 6.34)

Late Elementary (4-8) (n=11)

Minutes	Frequency	Percent
40	7	63.6%
45	3	27.3%
50	1	9%

Mean: 42.27 minutes (SD = 3.44)

Appendix B

Table B1. Frequency of moderate-intensity activity

18/19 schools indicated participation in moderate-intensity activity; 16/18 indicated how often (n=16)

Participation in Moderate-Intensity Activity	Frequency	Percent
Rarely (1-2x/yr)	5	31.3%
Sometimes (1-2x/month)	1	6.3%
Always (1x/week)	10	62.5%

18/19 schools indicated participation in moderate-intensity activity; 12/18 indicated class time spent in moderate-intensity activity (n=12)

Time spent in class period	Frequency	Percent
0.2 of class	1	8.3%
0.25 of class	3	25%
0.5 of class	5	41.6%
0.75 of class	2	16.6%
Entire class	1	8.3%

Table B2. Frequency of Vigorous-Intensity Activity

15/19 schools indicated participation in vigorous-intensity activity; 9/15 indicated how often (n=9)

Participation in Moderate-Intensity Activity	Frequency	Percent
Rarely (1-2x/yr)	3	33%
Sometimes (1-2x/month)	2	22%
Always (1x/week)	4	44%

15/19 schools indicated participation in vigorous-intensity activity; 6/15 indicated class time spent in vigorous-intensity activity (n=6)

Time spent in class period	Frequency	Percent
0.25 of class	1	16%
0.3 of class	1	16%
0.5 of class	1	16%
0.6 of class	3	50%